

(1) *Method 1.* (i) Determine the explosive equivalent weight of the liquid propellants by following § 420.67(c);

(ii) Add to the explosive equivalent weight of the liquid propellants, the net explosive weight of each division 1.3 explosive, treating division 1.3 explosives as division 1.1 explosives;

(iii) Use the combined net explosive weight to determine the minimum separation distance to each public area, public traffic route, and each other explosive hazard facility by following tables E-1, E-2, and E-3 of appendix E of this part; and

(iv) Separate each public area containing any member of the public in the open by a distance equal to  $-1133.9 + [389 \cdot \ln(\text{NEW})]$ , where the net explosive weight is greater than 450 pounds and less than 501,500 pounds.

(2) *Method 2.* (i) Determine the explosive equivalent weight of each liquid propellant by following § 420.67(c);

(ii) Add to the explosive equivalent weight of the liquid propellants, the net explosive weight of each division 1.3 explosive to determine the combined net explosive weight;

(iii) Use the combined net explosive weight to determine the minimum separation distance to each public area, public traffic route, and each other explosive hazard facility by following tables E-1, E-2, and E-3 of appendix E of this part; and

(iv) Separate each public area containing any member of the public in the open by a distance equal to  $-1133.9 + [389 \cdot \ln(\text{NEW})]$ , where the net explosive weight is greater than 450 pounds and less than 501,500 pounds.

(d) *Liquid propellants and division 1.1 and 1.3 explosives located together.* For liquid propellants and division 1.1 and 1.3 explosives located together, a launch site operator must:

(1) Determine the explosive equivalent weight of the liquid propellants by following § 420.67(c);

(2) Determine the total explosive quantity of each division 1.1 and 1.3 explosive by following § 420.65(a)(2);

(3) Add the explosive equivalent weight of the liquid propellants to the total explosive quantity of division 1.1 and 1.3 explosives together to determine the combined net explosive weight;

(4) Use the combined net explosive weight to determine the distance to each public area, public traffic route, and each other explosive hazard facility by following tables E-1, E-2, and E-3 of appendix E of this part; and

(5) Separate each public area containing any member of the public in the open by a distance equal to  $-1133.9 + [389 \cdot \ln(\text{NEW})]$ , where the net explosive weight is greater than 450 pounds and less than 501,500 pounds

(e) *Use of maximum credible event analysis.* If a launch site operator does not want to employ paragraphs (b), (c), or (d) of this section, the launch site operator must analyze the maximum credible event (MCE) or the worst case explosion expected to occur. If the MCE shows there will be no simultaneous explosion reaction of the liquid propellant tanks and the solid propellant motors, the minimum distance between the explosive hazard facility and all other explosive hazard facilities and public areas must be based on the MCE.

[Docket No. FAA-2011-0105, 77 FR 55115, Sept. 7, 2012]

#### § 420.70 Separation distance measurement requirements.

(a) This section applies to all measurements of distances performed under §§ 420.63 through 420.69.

(b) A launch site operator must measure each separation distance along straight lines. For large intervening topographical features such as hills, the launch site operator must measure over or around the feature, whichever is the shorter.

(c) A launch site operator must measure each minimum separation distance from the closest hazard source, such as a container, building, segment, or positive cut-off point in piping, in an explosive hazard facility. When measuring, a launch site operator must:

(1) For a public traffic route distance, measure from the nearest side of the public traffic route to the closest point of the hazard source; and

(2) For an intraline distance, measure from the nearest point of one hazard source to the nearest point of the next hazard source. The minimum separation distance must be the distance for the quantity of energetic liquids or net

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explosive weight that requires the greater distance.

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### § 420.71 Lightning protection.

(a) *Lightning protection.* A licensee shall ensure that the public is not exposed to hazards due to the initiation of explosives by lightning.

(1) *Elements of a lightning protection system.* Unless an explosive hazard facility meets the conditions of paragraph (a)(3) of this section, all explosive hazard facilities shall have a lightning protection system to ensure explosives are not initiated by lightning. A lightning protection system shall meet the requirements of this paragraph and include the following:

(i) *Air terminal.* An air terminal to intentionally attract a lightning strike.

(ii) *Down conductor.* A low impedance path connecting an air terminal to an earth electrode system.

(iii) *Earth electrode system.* An earth electrode system to dissipate the current from a lightning strike to ground.

(2) *Bonding and surge protection.* A lightning protection system must meet the requirements of this paragraph and include the following:

(i) *Bonding.* All metallic bodies shall be bonded to ensure that voltage potentials due to lightning are equal everywhere in the explosive hazard facility. Any fence within six feet of a lightning protection system shall have a bond across each gate and other discontinuations and shall be bonded to the lightning protection system. Railroad tracks that run within six feet of the lightning protection system shall be bonded to the lightning protection system.

(ii) *Surge protection.* A lightning protection system shall include surge protection to reduce transient voltages due to lightning to a harmless level for all metallic power, communication, and instrumentation lines entering an explosive hazard facility.

(3) *Circumstances where no lightning protection system is required.* No lightning protection system is required for an explosive hazard facility when a lightning warning system is available to permit termination of operations and withdrawal of the public to public

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area distance prior to an electrical storm, or for an explosive hazard facility containing explosives that cannot be initiated by lightning. If no lightning protection system is required, a licensee must ensure the withdrawal of the public to a public area distance prior to an electrical storm.

(4) *Testing and inspection.* Lightning protection systems shall be visually inspected semiannually and shall be tested once each year for electrical continuity and adequacy of grounding. A licensee shall maintain at the explosive hazard facility a record of results obtained from the tests, including any action taken to correct deficiencies noted.

(b) *Electrical power lines.* A licensee shall ensure that electric power lines at its launch site meet the following requirements:

(1) Electric power lines shall be no closer to an explosive hazard facility than the length of the lines between the poles or towers that support the lines unless an effective means is provided to ensure that energized lines cannot, on breaking, come in contact with the explosive hazard facility.

(2) Towers or poles supporting electrical distribution lines that carry between 15 and 69 KV, and unmanned electrical substations shall be no closer to an explosive hazard facility than the public area distance for that explosive hazard facility.

(3) Towers or poles supporting electrical transmission lines that carry 69 KV or more, shall be no closer to an explosive hazard facility than the public area distance for that explosive hazard facility.

### APPENDIX A TO PART 420—METHOD FOR DEFINING A FLIGHT CORRIDOR

#### (a) Introduction

(1) This appendix provides a method for constructing a flight corridor from a launch point for a guided suborbital launch vehicle or any one of the four classes of guided orbital launch vehicles from table 1, § 420.19, without the use of local meteorological data or a launch vehicle trajectory.

(2) A flight corridor includes an overflight exclusion zone in a launch area and, for a guided suborbital launch vehicle, an impact dispersion area in a downrange area. A flight corridor for a guided suborbital launch vehicle ends with the impact dispersion area,